SHORT COMMUNICATION

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Field efficacy of granular insecticides against yellow stem borer and gundhi bug of rice

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ABSTRACT

Four solid formulations of insecticides Viz., Carbofuran, Phorate, Cartap @ 1kg.a.i. ha^{-1} and Chlorpyriphos @ 0.5kg.a.i. ha^{-1} along with the check, liquid formulation of monocrotophos @ 0.5 kg a.i. ha^{-1} were applied against insect pest of rice during dry season 2009 and 2010. Result of the experiment conducted during dry season of 2009 revealed that Carbofuran treatment recorded lowest % of dead heart (4.2%), white ear head (4.5%), gundhibug damage (12.06%)and highest grain yield of 4.852 t ha^{-1} in variety Jaya followed by the treatment phorate, cartap, chlorpyriphos and monocrotophos. During dry season 2010, also Carbofuran treatment recorded lowest % of DH (3.7%),WEH (4.2%),gundhibug damage (20.16%) and highest grain yield of 4.13 t ha^{-1} followed by the treatment phorate, cartap, chlorpyriphos and monocrotophos. All the insecticides were found very effective against YSB and gundhibug in reducing their damage and increasing grain yield over control during both the years.

Key words: *granular insecticides, insect pest, rice*

Damage due to insect pests of rice is one of the major biotic constraints limiting realisation of potential yield. In India, the yellow stem borer caused 1% to 19% yield loss in early planted rice crops and 38% to 80% in late planted rice (Catinding and Heong, 2003). The rice bug, another important pest of rice, caused damage by feeding on the grains at milk stage and turn them chaffy. Of the 15 species of bug reported to infest rice crop in India, *Leptocorisa* spp. are considered serious (Gupta *et al.*1993). Chemical control is still considered as the first line of defense in rice pest management. Application of various granular and sprayable insecticidal formulations gives effective control of rice pests (Dash *et al.* 1996). Application of a few granular formulations in the nursery was more effective in controlling early stage pests of rice in the main field (Dash *et al.* 2004). Various chemical insecticides have been recommended to control the rice bugs (Misra, 2003). In the present paper, the comparative effectiveness of some granular insecticides evaluated in field condition against insect pest of transplanted rice has been reported.

Field experiments were conducted during dry seasons of 2009 and 2010 in a randomosized block design with three replications at Central Rice Research Institute, Cuttack to evaluate the efficacy of Four granules/solid formulations of insecticides viz., Carbofuran, Phorate, Cartap @ 1kg.a.i. ha^{-1} and Chlorpyriphos @ 0.5kg.a.i. ha^{-1} along with a standard check liquid formulation of monocrotophos @ 0.5 kg a.i. ha^{-1} against insect pests of rice. Rice variety Jaya was planted in plot size of 5m x 4m with a spacing of 20cm x 15cm with normal agronomic practices except plant protection. Application of insecticides was done at 55 days after transplanting (DAT). Observations on the incidence of dead hearts (DH) were taken on 20 randomly selected hills plot^{-1} from each replication 10 days after insecticide treatment. White ear head (WEH) was counted on 20 randomly selected hills from each plot just before harvest. Observation on gundhi bug damage was taken on randomly selected five panicles by counting the damage grain. Treatment-wise grain yield was recorded after harvest.

All the treatments significantly reduced the per cent infestation of the insect pests and at the same time significant increase in grain yield. Result of the experiment during dry season 2009 revealed that plots treated with carbofuran recorded lowest per cent of DH, WEH, gundhibug damage and highest grain yield of 3.206 t ha^{-1} followed by the treatment phorate, cartap, chlorpyriphos and monocrotophos. In the control plot, the grain yield was 2.061 ha^{-1} (Table 1). The grain yield increased over control was very high in carbofuran flowed by phorate, cartap, chlorpyriphos and in check insecticide monocrotophos. During dry season also carbofuran treatment recorded lowest percentage of DH (3.7%),WEH (4.2%), gundhibug damage (20.16%) and highest grain yield of 4.13 t ha^{-1} followed by the treatment phorate, cartap, chlorpyriphos and monocrotophos. In control, the grain yield was 2.81 t ha^{-1}. The grain yield increased over control was very high (46 %) in carbofuran flowed by phorate, cartap, chlorpyriphos and in check insecticide monocrotophos. Granular application of phorate and quinalphos for control of rice gundhibug was advocated by Singh (1993) which confirms the present finding. All the insecticides were found very effective against yellow stem borer and gundhibug during both the year in reducing pest damage as well as increasing grain yield over control significantly.

Table 1. Chemical control of insect pest of rice during dry season

Treatment	Dose	% DH		% WEH		% grain damage by gundhi bug		Yield (t ha^{-1})		% yield increase over control	
		2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Carbofuran	1kg a.i.ha^{-1}	4.20(11.65)	3.70(11.05)	4.50(12.23)	4.2(11.65)	12.06(20.1)	20.16(26.65)	4.85	4.13	49	46
phorate	1kg a.i.ha^{-1}	4.26(11.84)	4.96(12.85)	4.90(12.76)	4.26(11.84)	12.78(20.93)	26.51(30.83)	4.60	3.85	41	37
Cartap	1kg a.i.ha^{-1}	4.50(12.23)	5.53(13.58)	5.66(13.75)	4.96(12.85)	13.61(21.64)	26.06(30.61)	4.30	3.60	32	28
Chlorpyriphos	0.5kg a.i.ha^{-1}	5.00(12.89)	5.90(14.03)	5.80(13.92)	5.76(13.88)	13.63(21.66)	25.42(30.22)	4.25	3.46	30	23
Monocrotophos	0.5kg a.i.ha^{-1}	5.66(13.75)	6.26(14.48)	6.10(14.35)	5.96(14.11)	18.91(25.73)	26.00(30.58)	3.90	3.44	20	22
control	-	9.80(18.24)	8.76(17.21)	8.96(17.41)	8.66(17.11)	25.42(30.22)	34.32(35.84)	3.25	2.81	-	-
CD at 5%	-	1.12	1.5	1.06	2.6	3.21	4.2	0.44	0.6		

Data in the parentheses are angular transformed values.

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